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210. WAT RIFICATION,
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N° 9165 A.D. 1892

RECORDED

Date of Application, 14th May, 1892
Complete Specification Left, 14th Feb., 1893—Accepted, 13th May, 1893

PROVISIONAL SPECIFICATION.

A New or Improved Method of Purifying and Hardening Water for Use in the Manufacture of Malt Extract, and for Brewing and analogous purposes.

We, Richard Greenshiels Ross Engineer of Ravensleigh, Dowanhill Gardens, Joseph Banks Hilliard, Surgical Instrument Maker of 65 Renfield Street, and William Paterson, Manufacturing Chemist of Phœnix Works Maryhill, all of Glasgow in the County of Lanark, North Britain, do hereby declare the nature of this invention to be as follows :—

This invention relates to a new or improved method of purifying and hardening water by impregnating it with carbonate or bi-carbonate of lime (calcium bi-carbonate) and sulphate of lime (calcium sulphate), either combined or separately and in any suitable proportions, for use in the manufacture of malt extract, maltose, grape sugar, glucose, brewing ale or stout, malt vinegar, and the like.

In the carrying out of our invention we take any suitable quantity of water, preferably such water as is thoroughly suitable for domestic purposes and we add a suitable quantity of caustic lime (calcium oxide) and of lime chloride (calx chlorata) or of a mixture of the above. For ordinary purposes we use about 17 or 18 grains of the above mixture per gallon of water, or more or less of the caustic lime or of the mixture of caustic lime and lime chloride (for convenience to be hereinafter called limes), and we also use a suitable quantity of caustic alkali according to the state of purity of the water to be used and according to the particular purpose for which the water is required. We then agitate the mixture of water and limes until the lime is entirely or partly dissolved.

To the mixture of the water and lime, we now add sufficient sulphuric acid to neutralize about 11 to 13 grains of the lime and we again agitate the mixture.

To the mixture of water and lime which now contains sulphate of lime in solution (solution of calcium sulphate) we now cause to pass a stream of carbonic acid gas (carbonic anhydride), through, over or under the mixture until all the remaining caustic lime is neutralized and dissolved or partly dissolved in the mixture of water and lime.

The water containing the solution or combined solutions of carbonate or bi-carbonate of lime and sulphate of lime is now filtered or allowed to settle until clear for further use.

Dated this 13th day of May 1892.

JOHNSONS,
115, St. Vincent Street, Glasgow, Petitioners' Agents.

COMPLETE SPECIFICATION.

A New or Improved Method of Purifying and Hardening Water for Use in the Manufacture of Malt Extract, and for Brewing and analogous purposes.

We, Richard Greenshiels Ross Engineer of Ravensleigh, Dowanhill Gardens, Joseph Banks Hilliard, Surgical Instrument Maker of 65 Renfield Street, and William Paterson, Manufacturing Chemist of Phœnix Works Maryhill, all of Glasgow in the County of Lanark, North Britain, do hereby declare the nature of this invention and in what manner the same is to be

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performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a new or improved method of purifying and hardening water by impregnating it with carbonate or bi-carbonate of lime (calcium bi-carbonate) and sulphate of lime (calcium sulphate), either combined or separately and in any suitable proportions, for use in the manufacture of malt extract, maltose, grape sugar, glucose, brewing ale or stout, malt vinegar, and the like.

In the carrying out of our invention we take any suitable quantity of water, preferably such water as is thoroughly suitable for domestic purposes and we add a suitable quantity of caustic lime (calcium oxide) and we may if desired, use a suitable quantity of lime chloride (calx chlorata) or of a mixture of the above, or a mixture of caustic alkalies.

For ordinary purposes we use a saturated solution of the above named caustic lime or the caustic lime and lime chloride and we may also use a suitable quantity of caustic alkali according to the state of purity of the water to be used and according to the particular purposes for which the water is required.

The mixture of caustic lime we prefer to use is generally about 17 grains or thereby of caustic lime to the gallon of water. We then agitate the mixture and lime until the lime is entirely or partly dissolved,—and we then filter the solution from all insoluble matter or allow the insoluble matter to settle and draw the clear liquor off.

To the mixture of the filtered water and lime, we now add sufficient sulphuric acid to neutralize about 11 to 13 grains or thereby of the lime and we again agitate the mixture.

To the mixture of water and lime which now contains sulphate of lime in solution (solution of calcium sulphate) we now cause to pass a stream of carbonic acid gas (carbonic anhydride) through, over or under the mixture until all the remaining caustic lime is neutralized and dissolved or partly dissolved in the mixture of water and lime,—or alternately after the caustic lime has been neutralized with the carbonic acid sufficient sulphuric acid can be added to neutralize about $\frac{3}{4}$ or thereby of the bi-carbonate or carbonate of lime present.

The water containing the solution or combined solutions of carbonate or bi-carbonate of lime and sulphate of lime is now filtered or allowed to settle until clear for further use.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

The process for purifying and hardening water for use in the manufacture of malt extract and for brewing and analogous purposes as described.

Dated this 13th day of February 1893.

JOHNSONS,
115, St. Vincent Street, Glasgow, Applicants' Agents.

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